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ON THE RELATIONSHIP BETWEEN SMOKING AND FEMALE LUNG CANCER

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There is still controversy about the relationship between cigarette smoking and female lung cancer. The mortality rate of female lung cancer in Tianjin is the highest in China ($28.3/10^5$). The female smoking rate in Tianjin is also the highest in China. Therefore we had conducted a case-control study of female lung cancer to illustrate it.

MATERIAL AND METHODS

We conducted a 1:1 pair matched case-control study.

1. Cases: 157 female lung cancer cases all resident in Tianjin more than 10 years. Squamous cell carcinoma 35(22.3%); Small cell carcinoma 31(19.7%); Adenocarcinoma 58(36.9%); Large cell carcinoma 4(2.5%); Cell type unknown 29(18.5%). Cases were diagnosed: 133(84.7%) histologically or cytologically; 17(10.8%) by CT; 7(4.5%) clinically or by X-ray.

2. Controls: 157, matched with sex, race, age(±2 years) and marital status.

RESULTS

1. The case group is a quite representative of the Tianjin female lung cancer. The age group structure and distribution of residents of the lung cancer group is quite similar with those of 1983 Tianjin female lung cancer. Smoking rate of the control group(40.8%) is quite similar with that of the Tianjin adult female population(39.5% &58%).

2. The age, education, occupation, race, marital status, birth place, resident place of the case and control groups have no significant difference($P>0.05$).

3. Female lung cancer and active smoking

OR of active smoking is 3.05, PAR% is 57.4% (Table 1).

TABLE 1. OR OF SMOKING

		Controls	
		Smoker	Nonsmoker
Cases	Smoker	45	58
	Non-smoker	19	35

OR=3.05, 95%CI=1.77-5.30
Adjusted OR=2.6, 95% CI=1.4-4.6, $P<0.001$

Exposure rate of cases:

$$\frac{45+58}{157}=65.6\%$$

$$PAR\%=\frac{.656(3.05-1)}{.656(3.05-1)+1}=57.4\%$$

There is quite obvious dose-effect relationship between lung cancer risk and number of cigarettes smoked per day and year of smoking(Table 2).

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OR is higher of those smoking deeper than those smoke superficially or non-smoking (Table 3). OR is higher among those start smoking earlier (Table 4).

TABLE 2. LUNG CANCER RISK AND NO. OF CIGARETTES AND YEAR OF SMOKING

No. of cigarettes/day	OR	95% CI of OR
0-	1	
1-	1.81	1.40-2.33
11-	3.27	2.28-4.68
21-	5.90	3.79-9.18
Year of smoking		
0	1	
1-	1.73	1.38-2.18
20-	3.00	2.17-4.16
40-	5.20	3.49-7.75

TABLE 3. OR AND DEGREE OF INHALATION (M-H METHOD)

	No	Occasional	Deep
Case	54	37	66
Control	98	33	26
OR	1	2.03	4.61

P<0.01

TABLE 4. OR AND AGE ONSET OF SMOKING (M-H METHOD)

Age	Group	Non-smoking	21	16-20	15	P
<44	Case	8	1	3	0	>0.05
	Control	12	0	1	0	
45-	Case	16	8	17	14	<0.01
	Control	29	9	14	3	
55-	Case	24	13	13	15	<0.01
	Control	35	18	6	5	
65-	Case	6	6	6	7	<0.01
	Control	17	4	2	2	
	OR	1	1.59	3.10	6.3	<0.01

4. Female lung cancer and passive smoking.

We had calculated the OR of passive smoking from husband, father, mother and colleagues, only that from husband is quite significant.

The non-smoking female cases and controls with smoking or non-smoking husband is as table 5. The OR is 2.16 (P<0.05).

TABLE 5. OR OF SMOKING HUSBAND TO NON-SMOKING WIFE

	Husband	
	Smoker	Non-smoker
Case	34	20
Control	41	52

OR=2.16 95% CI=1.01-4.53,

P<0.05

Exposure rate of cases

$$= \frac{34}{34+20} = 0.63$$

$$PAR\% = \frac{.63(2.16-1)}{.63(2.16-1)+1} = 42.2\%$$

OR of female lung cancer increases with the number of cigarettes smoked per day by her hus-

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band and the duration of exposure to her husband's smoking(Table 6).

5.OR of either active or passive and combination of active and passive smoking is as table 7.

TABLE 6.OR OF FEMALE LUNG CANCER OF SMOKING HUSBAND

HUSBAND SMOKING	OR	95%CI OF OR
CIGARETTE PER DAY		
0	1	
1-	1.40	1.12-1.76
10-	1.97	1.42-2.72
20-	2.76	1.85-4.10
YEARS OF EXPOSURE		
0	1	
1-	1.49	1.15-1.94
20-	2.23	1.54-3.22
40-	3.32	2.11-5.22

TABLE 7.OR OF ACTIVE AND PASSIVE SMOKING FROM HUSBAND

		ACTIVE SMOKING(WIVES)	
		NO	YES
HUSBAND SMOKING	NO	1.0	2.61(1.4-4.6)
	YES	1.86(1.04-3.5)	4.90(1.8-9.5)

If a smoking woman with smoking husband,the OR of lung cancer is 4.9,exposure rate is 81% (83/103).

$$PAR\% = \frac{.81\ (4.9 - 1)}{.81(4.9-1) + 1} = 75.95\%.$$

A non-smoking woman with smoking husband,the OR of lung cancer is 1.86,exposure rate is 63% (34/54).

$$PAR\% = \frac{.63\ (1.86 - 1)}{.63(1.86-1) + 1} = 35.1\%.$$

According to 103 smoking female lung cancer cases about 78.23(103 X .7595) are due to smoking,while the 54 non-smoking female lung cancer cases about 18.95(54 X .351) are due to passive smoking from her husband.

That is $\frac{78.23+18.95}{103+54} = 61.9\%$ of female lung cancer in Tianjin may attribute to active smoking and passive smoking from their husbands.

6. OR of female lung cancer due to other causes.

Occupational exposure: Textile workers,workers expose to asbestos, benzene,etc. OR=3.1,95% CI=1.58-6.02.

OR of history of lung diseases (include pulmonary TBC,chronic bronchitis,pulmonary infection,etc.)is 2.64.Adjusted with conditional regression model,OR=2.12,95%CI of OR=1.23-3.63.

OR of lung cancer and cooking with coal is shown in table 8.

7. Joint Effect of the Risk Factors.

Multifactor analysis by conditional regression method demonstrate that the combination of active smoking,passive smoking from husbands, occupational exposure,history of lung diseases and 4×10^4 hours cooking with coal makes the OR being about 50 in comparison with those

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without the above risk factors and cooking with coal less than $3X10^4$ hours. 95% CI of OR=13.7-185.3.

TABLE 8. OR OF LUNG CANCER AND COOKING WITH COAL

DURATION OF COOKING(hrs)	OR	95% CI of OR
$1X10^4$(1.5 hr/day,20 yrs)	1.54	1.20-1.96
$2X10^4$(1.5 hr/day,40 yrs)	2.36	1.66-3.34
$3X10^4$(2 hrs/day,42 yrs)	3.62	2.36-5.55
$4X10^4$(3 hrs/day,37 yrs)	5.56	3.40-9.10

CONCLUSION

1. Both active smoking and passive smoking from her husband are the most important risk factors of female lung cancer in Tianjin. About 60% of female lung cancer in Tianjin may be attributed to smoking.

2. There is joint effect of smoking with occupational exposure,history of lung diseases and cooking with coal.

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